

# Understand Earned Value In Under an Hour:

## From WBS to Performance Measurement Baseline

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## Objectives

- **Genesis**  
Understanding the link between requirements and The WBS
- **Scheduling**  
Understand the development of a schedule
- **Budgeting**  
Understand how cost estimates are developed
- **Earned Value**  
Identify how earned value calculations are accomplished
- **Reporting**  
Know how earned value (EV) can be used to measure project progress



## Genesis

**Understanding the link between requirements and The WBS**

- **Where do we start ?**
- **Contract**
- **SOW**
- **RFP**
- **Project charter**
- **Any others**



## Obtaining Good Requirements

- **Why are good requirements essential?**
- **How do you obtain good requirements?**
- **Take time to do it**
- **Ask the right people the right questions**
- **Draw a picture**
- **Build a model**
- **Build a little**
- **Check and re-check**



## Genesis

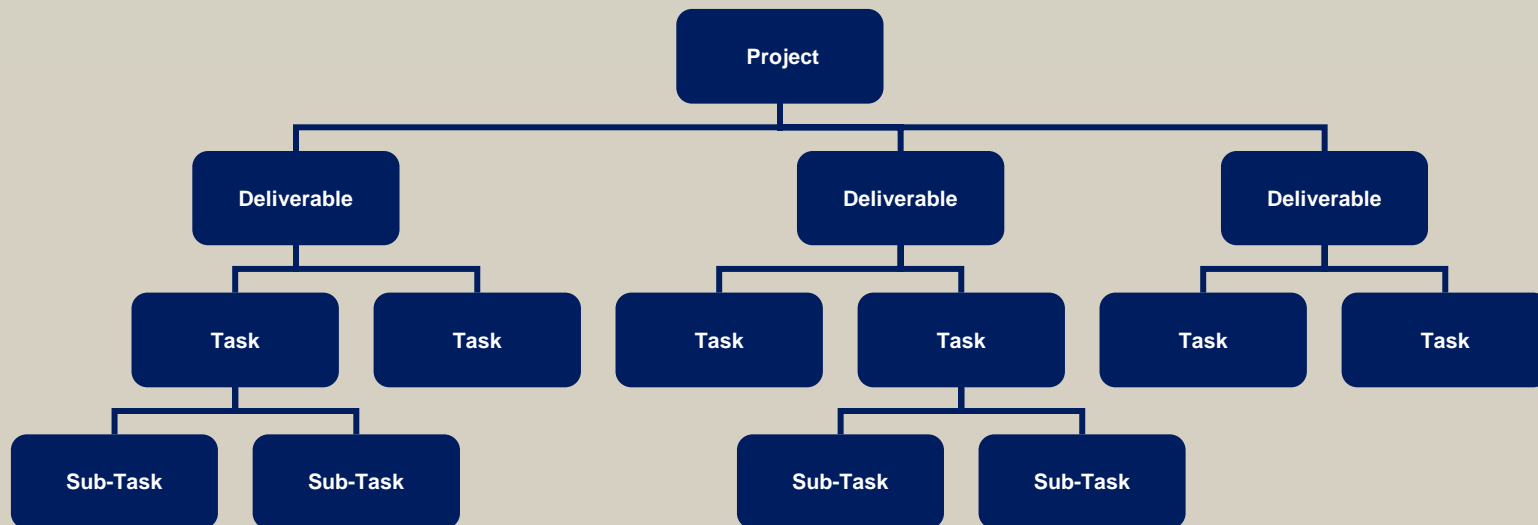
**Understanding the link between requirements and the WBS**

- **What is a WBS?**
- **Why is it important?**
- **How low do you go?**
- **Why an 80 - hour rule?**
- **Let's look at a WBS!**



## Genesis

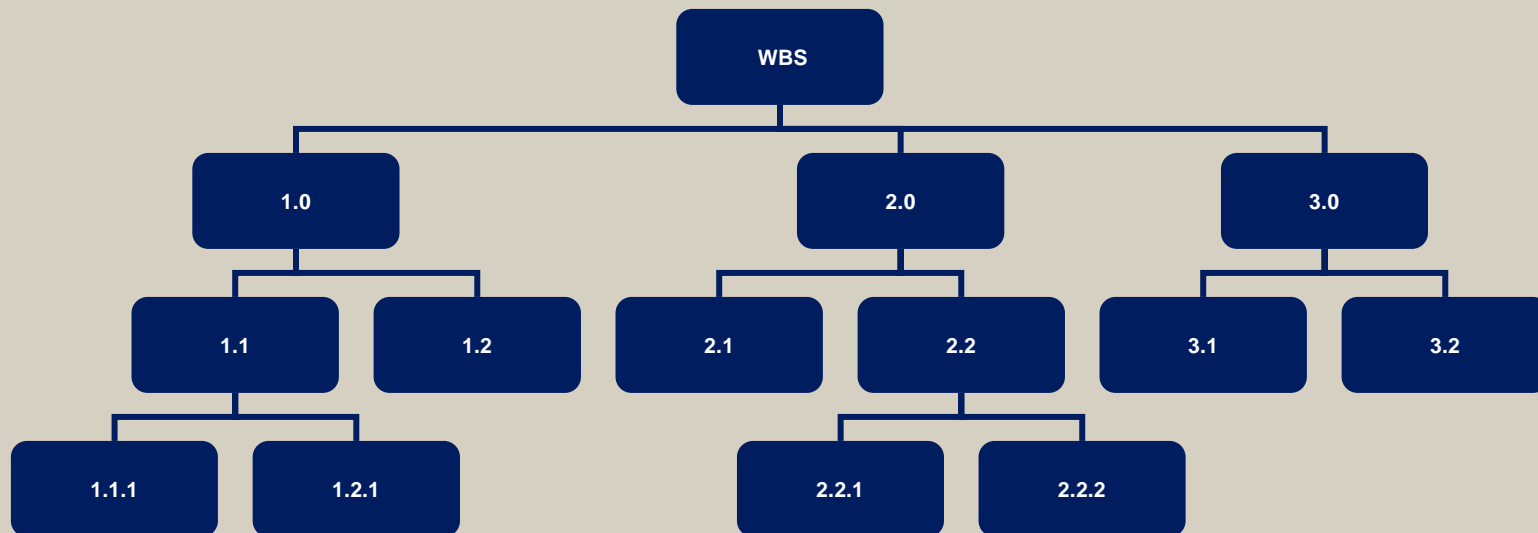
Understanding the link with requirements and the WBS





## Genesis

Understanding the link with requirements and the WBS  
Another View





## Scheduling

- What do you have at this point?
- Who knows what must be done and in what order?
- What tools are available for scheduling?
- What do scheduling and a game of chess have in common?



## Scheduling

- What comes first?
- What comes second?
- Any restrictions?
- When do tasks start and end?
- What do you now know?



## Time Estimating

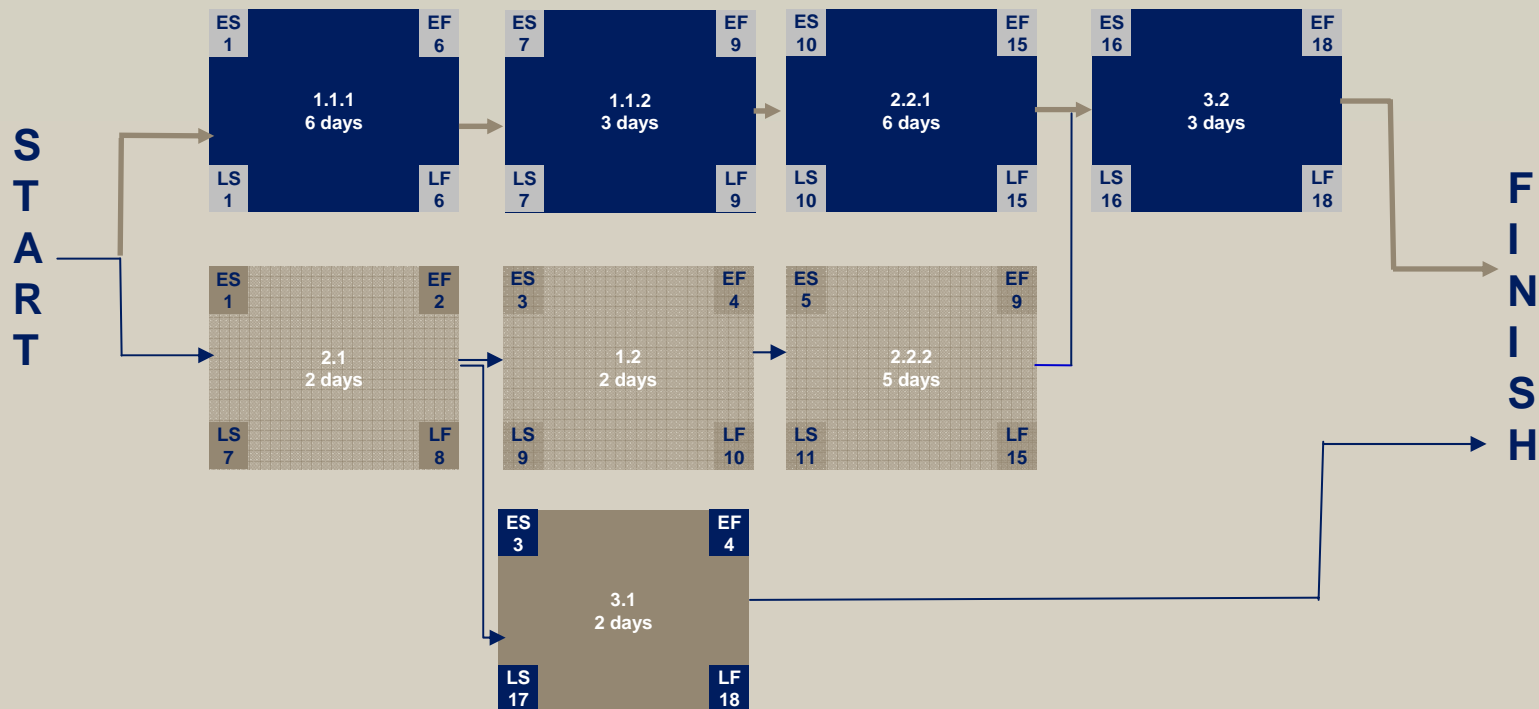
- **Get good estimates**
- **Know how good**
- **Think of optimistic, most likely, and pessimistic**
- **Don't pad**
- **Don't be the martyr**



## Develop a Schedule

Blue denotes the critical path

Project duration = 18 days





## Budgeting

- What do you have at this point?
- Where do your estimates come from?
- Where should they come from?
- What are the differences?



## The Gantt Chart View

Task	Cost at \$10,000/day per task																		
1.1.1		Days 1 - 6																	
2.1		1 - 2																	
1.2				3 - 4															
3.1				3 - 4															
2.2.2						5 - 9													
1.1.2								7 - 9											
2.2.1											10 - 15								
3.2																	16 - End		
	Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18



**\$10,000/day each task**

Days	Task	Total	Cumulative Total
1	1.1.1 + 2.1 =	\$20,000	\$20,000
2	1.1.1 + 2.1 =	\$20,000	\$40,000
3	1.1.1 + 2.1 + 3.1 =	\$30,000	\$70,000
4	1.1.1 + 2.1 + 3.1 =	\$30,000	\$100,000
5	1.1.1 + 2.2.2 =	\$20,000	\$120,000
6	1.1.1 + 2.2.2 =	\$20,000	\$140,000
7	2.2.2 + 1.1.2 =	\$20,000	\$160,000
8	2.2.2 + 1.1.2 =	\$20,000	\$180,000
9	2.2.2 + 1.1.2 =	\$20,000	\$200,000
10	2.2.1 =	\$10,000	\$210,000
11	2.2.1 =	\$10,000	\$220,000
12	2.2.1 =	\$10,000	\$230,000
13	2.2.1 =	\$10,000	\$240,000
14	2.2.1 =	\$10,000	\$250,000
15	2.2.1 =	\$10,000	\$260,000
16	3.2 =	\$10,000	\$270,000
17	3.2 =	\$10,000	\$280,000
18	3.2 =	\$10,000	\$290,000



## The Cumulative Cost Curve

Total Cost = BAC = \$290k





## Spending Rates

- Budget at completion (BAC) is \$290k
- Why at 9 days (half of 18 days) are we at \$200k and not \$145k (half of \$290k)?
- Why is the cost curve not linear?
- How does this correlate to EV?



## Tying in the Cumulative Cost Curve and EV

- **Planned Value (PV)** – Planned costs for the planned work to be done at a particular time
- **Earned Value (EV)** – The percentage of the planned work that was accomplished
- **Actual Costs (AC)** – Amount spent on the work that was accomplished
- **Budget at Completion (BAC)** = Total planned costs



## The Old Value References – AKA: Alphabet Soup

**Planned Value (PV) = Budgeted Cost of Work Scheduled (BCWS)**

**Earned Value (EV) = Budgeted Cost of Work Performed (BCWP)**

**Actual Costs (AC) = Actual Cost of Work Performed (ACWP)**

**Budget at Completion (BAC) – Total planned costs**



## Tying in the Cumulative Cost Curve and EV

- The \$290k that is the total costs of all work to be done = **BAC**
- The \$200k at day 9 is the **PV**
- The % assessed of the work done is the **EV**
- The actual costs spent on the work done is **AC**



## Earned Value

- **Schedule Variance (SV) = EV – PV**
- **Schedule Performance Index (SPI) = EV / PV**
- **Cost Variance (CV) = EV – AC**
- **Cost Performance Index (CPI) = EV / AC**
- **\*Estimate at Completion (EAC) = BAC / CPI**



## Earned Value

- Notice all formulas are dependent on EV
- Typical variance is planned – actual dollars spent or  $PV - AC$
- We are determining the percent of the work that was completed based on what we planned to do
- EV shows you what you did versus what you said you would do



## Earned Value

- Practice makes perfect!
- We know the following:

BAC = **\$290k**

Day 9 PV – what is it?

**\$200k**

- If at day 9 we have accomplished 80% of the scheduled work we can calculate the EV. What is it?  
**\$160k**
- Accounting tells us we have spent \$175,000 – what does this tell us?  
**\$175k = AC**



## Earned Value

- **Identify and calculate the following**

PV, EV, AC

CV

CPI

SV

SPI

EAC



## Earned Value – Answers

**Identify and calculate the following**

- PV, EV, AC =  
\$200k, \$160k, and \$175k
- $CV = EV - AC$   
 $160k - 175k = -\$15k$   
**Rule of thumb – negative is BAD!**
- $CPI = EV / AC$   
 $160k / 175k = \text{\$.91 or 91\%}$
- How are we doing?



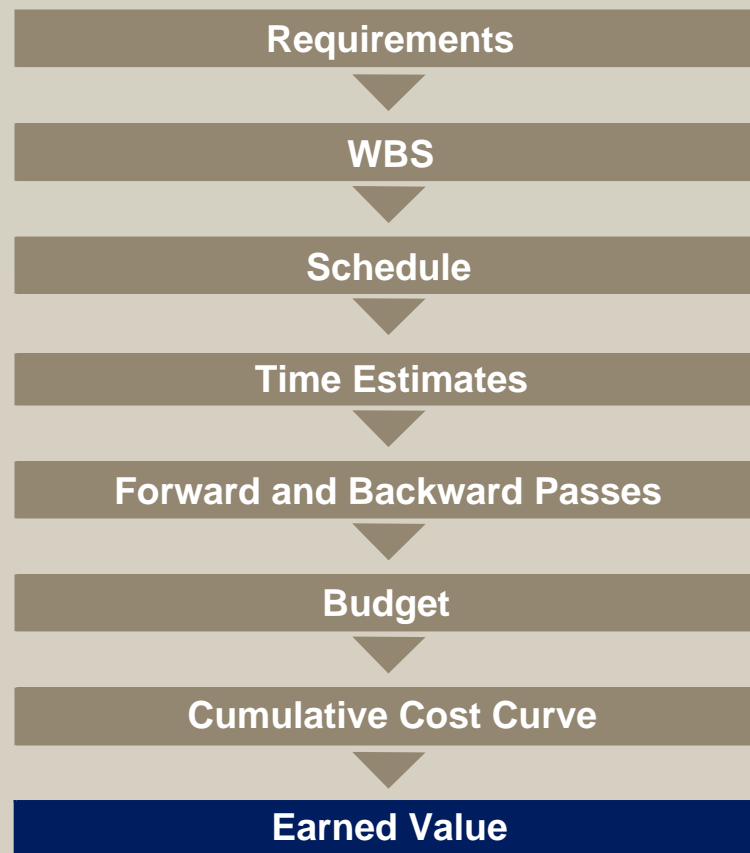
## Earned Value – Answers

**Identify and calculate the following**

- $SV = EV - PV$   
 $160k - 200k = \text{\textcolor{brown}{-$40k}}$
- $SPI = EV / PV$   
 $160k / 200k = \text{\textcolor{brown}{$.80 or 80\%}}$
- $EAC = BAC / CPI$   
 $290k / .91 = \$318k$



## The Process





## Earned Value — Summary

- **Connect the performance measurement baseline to the cumulative cost curve**
- **Connect the cumulative cost curve to the schedule**
- **Connect the schedule to the WBS**
- **Connect the tasks to estimating and budgeting**
- **Connect the WBS to the requirements**
- **Connect the requirements to the project**

## Contact Information

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